

**DISPLAY Elektronik GmbH**

# DATA SHEET

**LCD MODULE**

**DEM 800480Z1 VMX-PW-N**

*Product Specification*

*Version:4*

**19.07.2022**

# GENERAL SPECIFICATION

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MODULE NO. :

**DEM 800480Z1 VMX-PW-N**

CUSTOMER

VERSION NO.	CHANGE DESCRIPTION	DATE
0	Original Version	23.12.2020
1	Change the Temperature	08.01.2021
2	Change the Drawings	24.03.2021
3	Change the drawings and IC	07.06.2022
4	Update spec	19.07.2022

PREPARED BY: YK

DATE: 19.07.2022

APPROVED BY: WH

DATE: 19.07.2022

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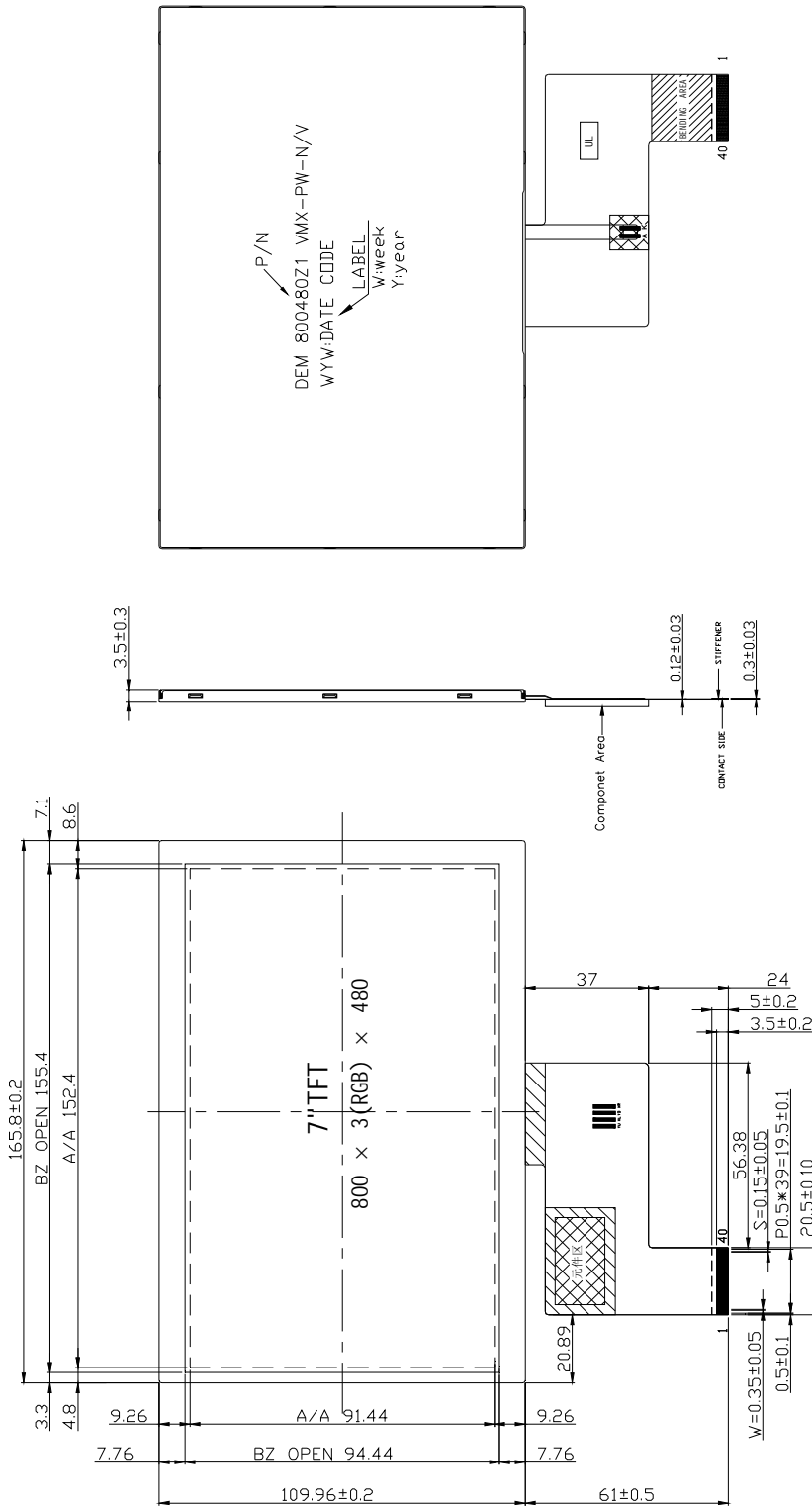
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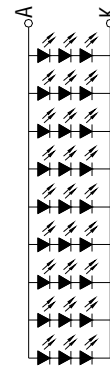
**1. GENERAL SPECIFICATIONS**

<b>ITEM</b>	<b>STANDARD VALUE</b>	<b>UNIT</b>
LCD TYPE	TFT/IPS/ NORMALLY BLACK/TRANSMISSIVE	
MODULE SIZE	165.80 x 109.96 x3.50	mm
ACTIVE AREA	152.40 x 91.44	mm
PIXEL PITCH (W*H)	0.1905 x 0.1905	
NUMBER OF PIXELS	800 x 480	
DRIVER IC	RM533C0+RM577C1	
INTERFACE TYPE	LVDS	
RECOMMEND VIEWING DIRECTION	ALL	O'clock
GRAY SCALE INVERSION DIRECTION	-	O'clock
COLORS	16.7 MILLION	
BACKLIGHT TYPE	27-DIES WHITE LED	
TOUCH PANEL TYPE	WITHOUT	

2. EXTERNAL DIMENSIONS



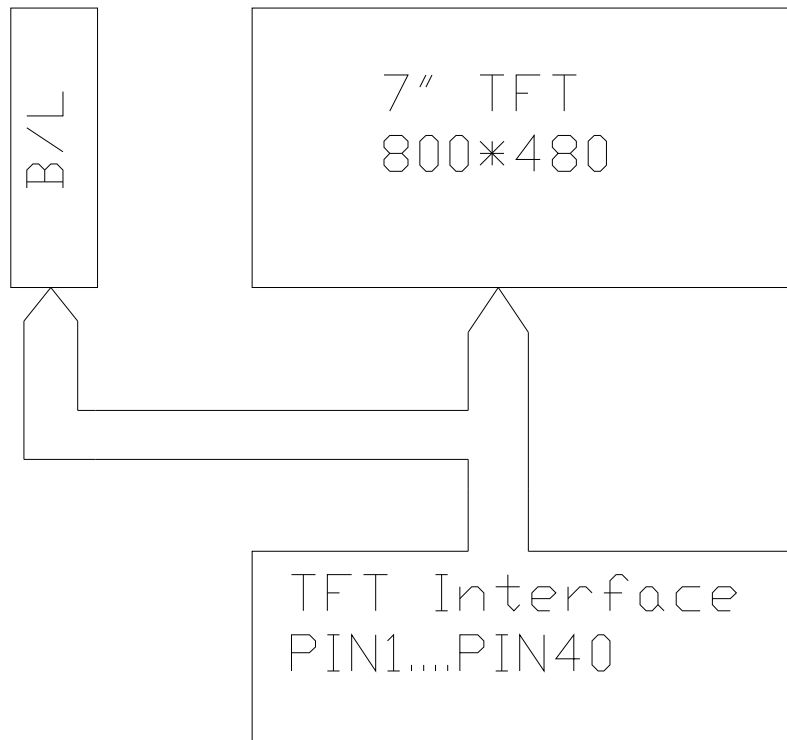
3. Circuit Diagram (LED 3\*9=27 SMD) Color: WHITE



180mA @ 9V(TYP)  
Brightness 500cd/m2(TYP)

- Remark:
1. Unmarked tolerance is ±0.3
  2. All materials comply with RoHS
  3.  ...:critical dimension.

**3. BLOCK DIAGRAM**



**4. PIN ASSIGNMENT**

PIN NO.	SYMBOL	DESCRIPTION
1	NC	Not connection
2	VDD	Power supply
3	VDD	Power supply
4	NC	Not connection
5	RESET	Reset pin
6	STBYB	Standby mode. STBYB = "L", timing controller, and source driver will turn off, all output are 0V. STBYB = "H", normal operation. Note: For all interfaces, STBYB has to be connected for proper power sequence.
7	GND	Power ground
8	RX3+	LVDS data input
9	RX3-	LVDS data input
10	GND	Power ground
11	RX2+	LVDS data input
12	RX2-	LVDS data input
13	GND	Power ground
14	RXCLK+	LVDS Clock input
15	RXCLK-	LVDS Clock input
16	GND	Power ground
17	RX1+	LVDS data input
18	RX1-	LVDS data input
19	GND	Power ground
20	RX0+	LVDS data input
21	RX0-	LVDS data input
22	GND	Power ground
23	NC	Not connection
24	NC	Not connection
25	GND	Power ground
26	NC	Not connection
27	NC	Not connection
28	NC	Not connection
29	NC	Not connection
30	GND	Power ground

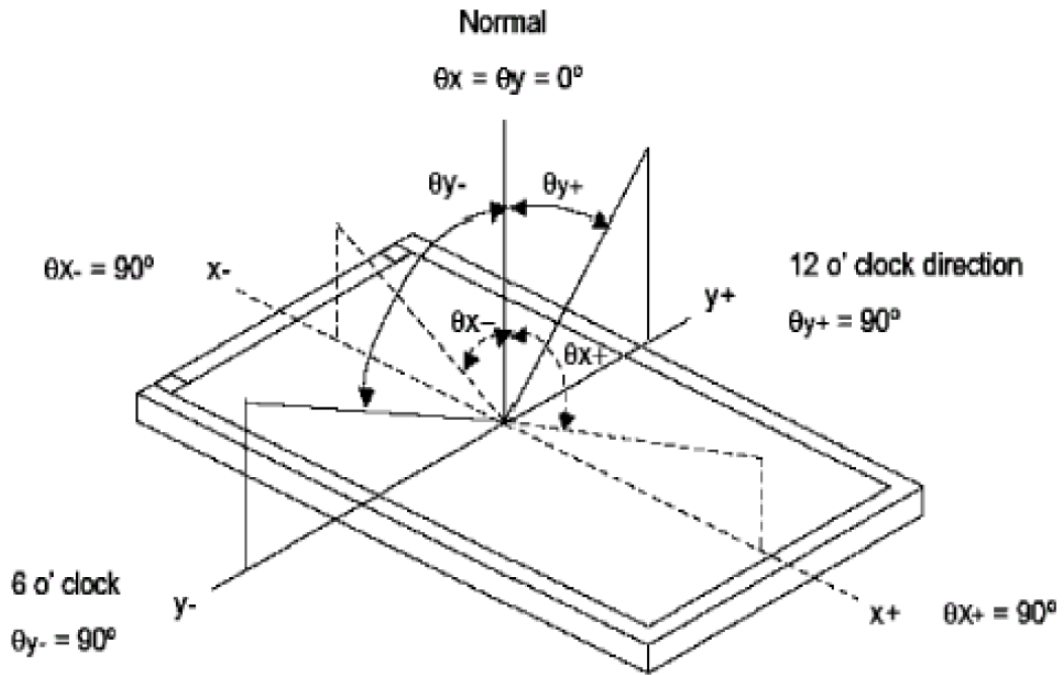
31	LED-	LED Cathode
32	LED-	LED Cathode
33	L/R	Source Right or Left sequence control. L: shift left: last data = S1←S2←S3.....←S2400 = first data. H: shift right: first data = S1→S2→S3.....→S2400 = last data.
34	U/D	Gate Up or Down scan control. Normally pull low. UPDN = "L", STV2 output vertical start pulse and UD pin output logical "0" to Gate driver.(Default) UPDN = "H", STV1 output vertical start pulse and UD pin output logical "1" to Gate driver.
35	NC	Not connection
36	NC	Not connection
37	NC	Not connection
38	NC	Not connection
39	LED+	LED Anode
40	LED+	LED Anode



**5. OPTICAL CHARACTERISTICS**

ITEM	SYMBOL	CONDITIONS	SPECIFICATIONS			UNIT	NOTE	
			MIN	TYP.	MAX			
Luminance	L		400	500	-	Luminance	L	
Contrast ratio	CR	$\theta = 0^\circ$	600	1000		Contrast ratio	CR	
Response time	Rising	$T_R$	25°C $\theta = 0^\circ$	25	Response time	Rising Falling	$T_R$ $T_F$	
	Falling	$T_F$						
CIE COLOUR COORDINATE	RED	XR	$CR \geq 10$	0.644	0.664	CIE COLOUR COORDINATE	RED	XR
		YR		0.301	0.321			YR
	GREEN	XG		0.27	0.29		GREEN	XG
		YG		0.531	0.551			YG
	BLUE	XB		0.114	0.134		BLUE	XB
		YB		0.095	0.115			YB
	WHITE	XW		0.271	0.291		WHITE	XW
		YW		0.306	0.326			YW
VIEWING ANGLE	Hor.	$\theta_{x+}$	$CR \geq 10$	75	80	VIEWING ANGLE	Hor. Ver.	$\theta_{x+}$
		$\theta_{x-}$		75	80			$\theta_{x-}$
	Ver.	$\theta_{y+}$		75	80			$\theta_{y+}$
		$\theta_{y-}$		75	80			$\theta_{y-}$

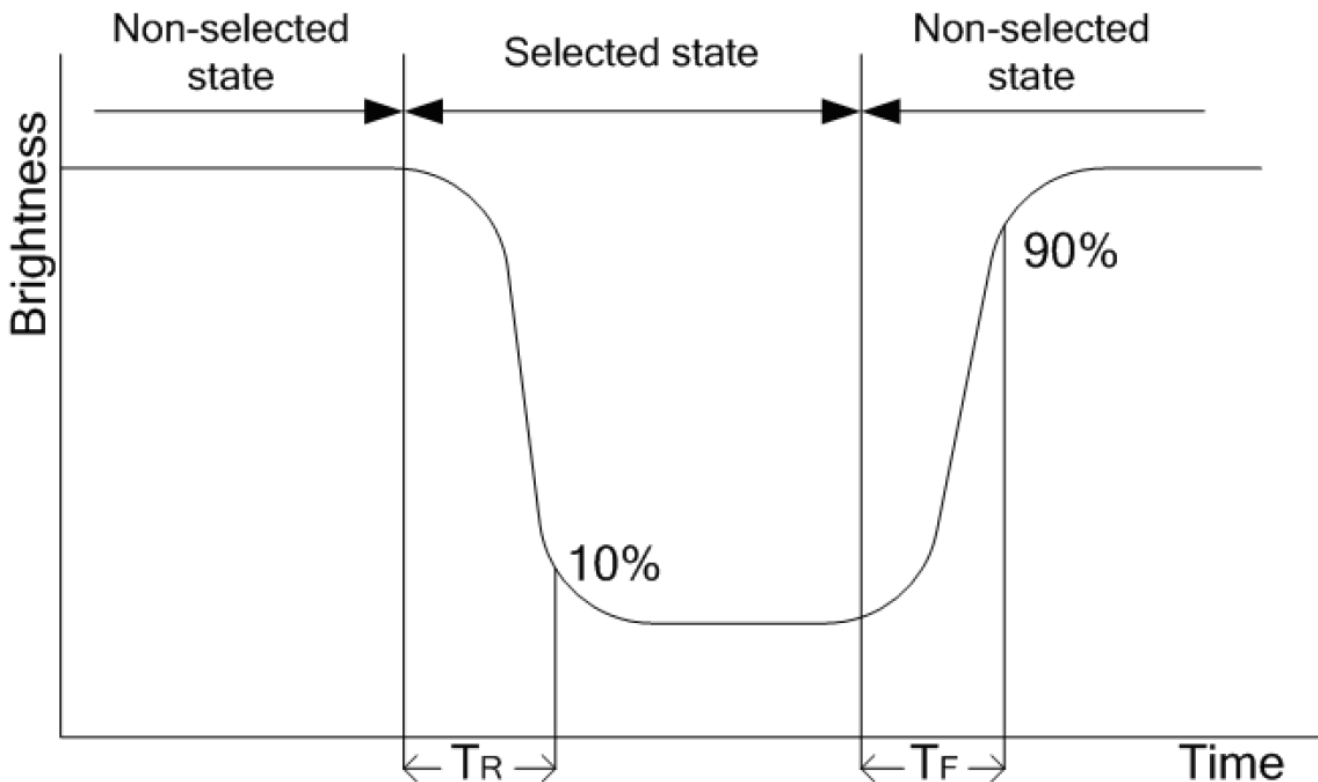
Note 1 : Definition of Viewing Angle  $\theta_x$  and  $\theta_y$  :



Note 2: Definition of contrast ratio CR:

$$CR = \frac{\text{Brightness of non-selected dots (white)}}{\text{Brightness of selected dots (black)}}$$

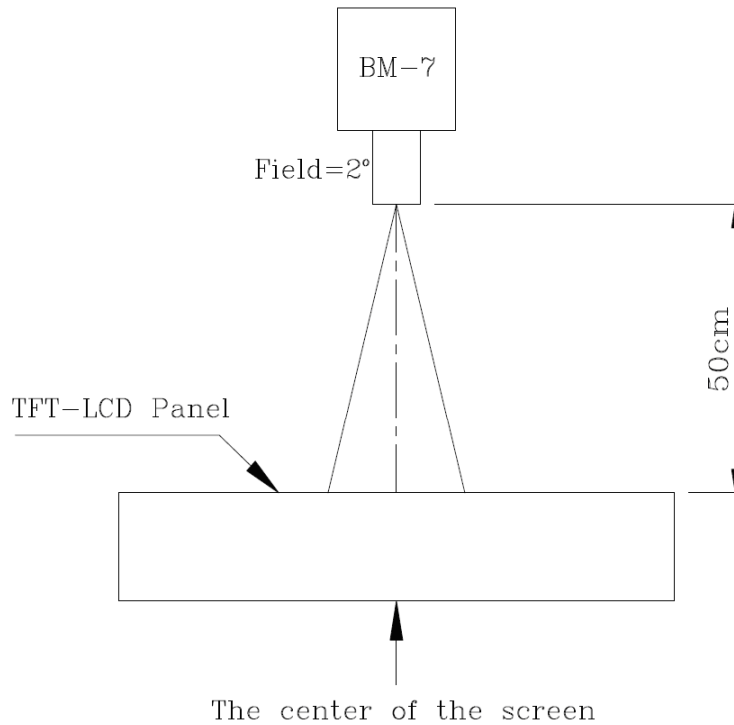
Note 3: Definition of response time ( $T_R$ ,  $T_F$ )



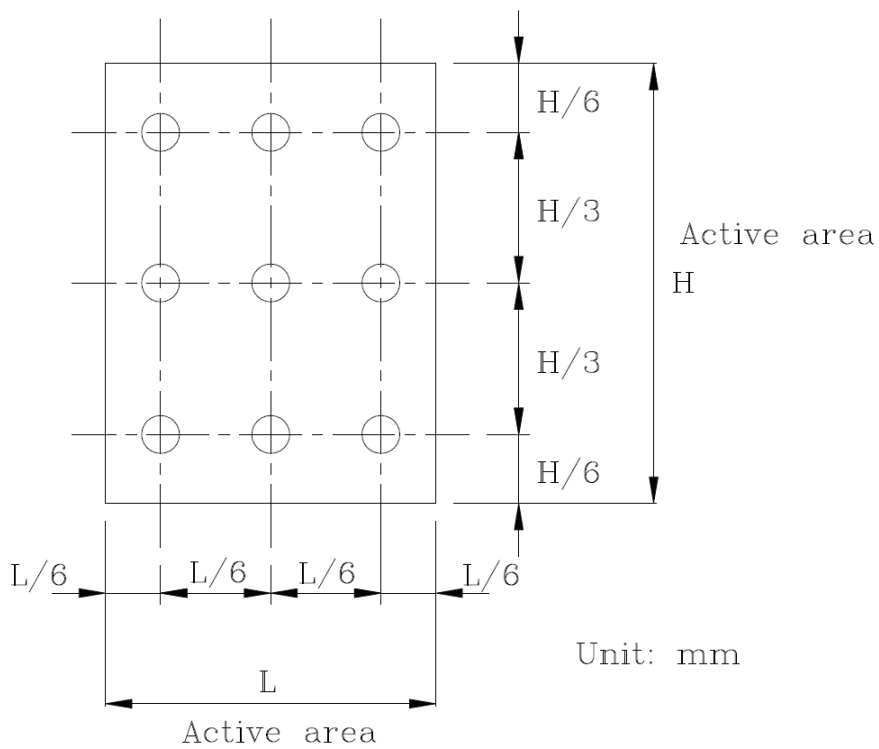
**Note 4: Definition of Luminance**

**① The Brightness Test Equipment Setup**

Field=2° (As measuring “black” image, field=2° is the best testing condition)



**② The Brightness Test Point Setup**



**6. ABSOLUTE MAXIMUM RATINGS**

PARAMETER	SYMBOL	MIN	MAX	UNIT
Power Supply Voltage	VDD	-0.5	6.0	V
Operating Temperature	Top	-30	+85	°C
Storage Temperature	Tst	-30	+85	°C

**7. ELECTRICAL CHARACTERISTICS**

**7.1 BLACKLIGHT DRIVING CONDITIONS**

ITEM	SYMBOL	SPECIFICATIONS			UNIT	REMARK
		MIN	TYP.	MAX		
Supply Voltage	Vf		9		V	
Supply Current	IL		180		mA	
Power Consumption	P		1.62		W	
LED Lifetime			50,000		H <sub>r</sub>	

**7.2 ELECTRICAL CHARACTERISTICS**

ITEM	SYMBOL	MIN	TYP.	MAX	UNIT
Power Supply	VDD	3.2	3.3	3.4	V
Input Voltage	Vil	VSS	-	0.3VDD	V
	Vih	0.7VDD	-	VDD+0.3	V

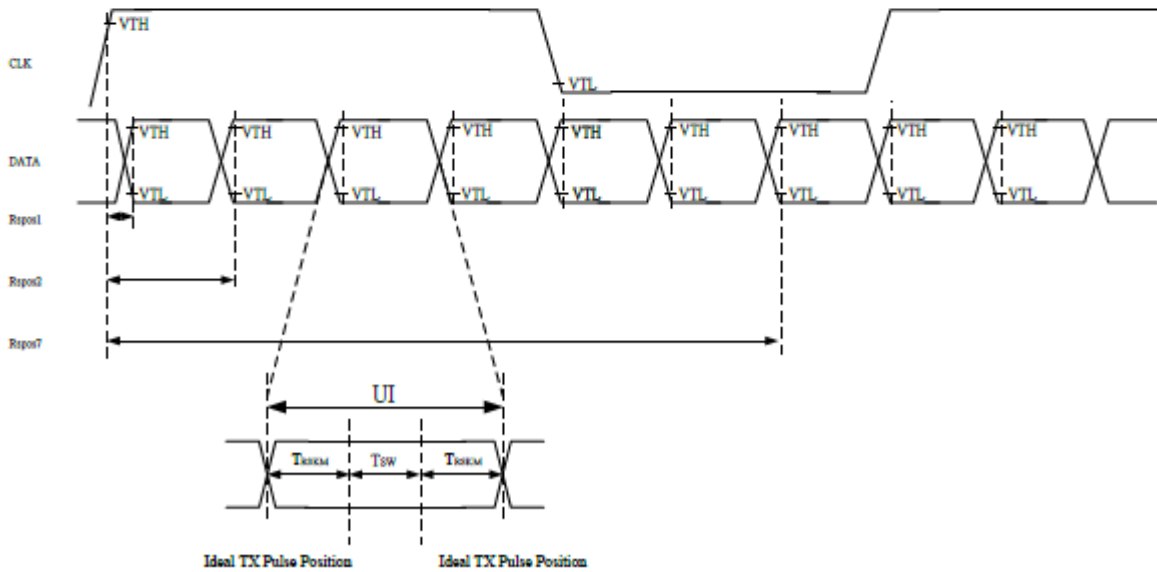
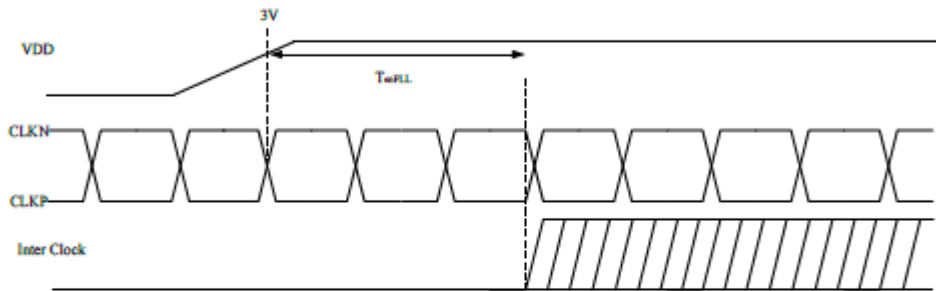
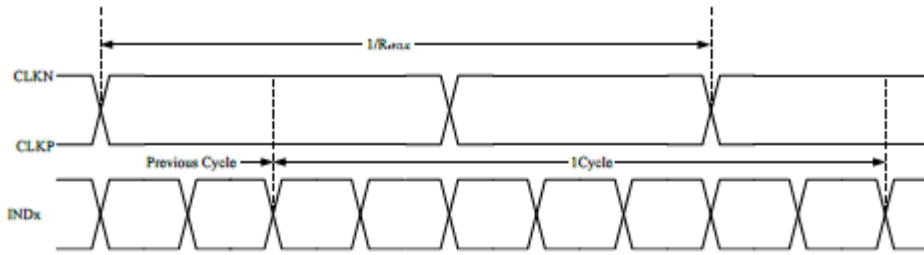
## 8. TIMING CHARACTERISTICS

## 8.1

( LVDS mode)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Clock frequency	RXFCLK	20	-	85	MHz	Htotal * Vtotal > 330000
Clock frequency	RXFCLK	2	-	30	MHz	500000>Htotal * Vtotal > 34000
1 data bit time	UI		1/7		1/ RXFCLK	
Position 1	Rspos1	-0.21	0	0.21	UI	
Position 2	Rspos2	0.79	1	1.21	UI	
Position 3	Rspos3	1.79	2	2.21	UI	
Position 4	Rspos4	2.79	3	3.21	UI	
Position 5	Rspos5	3.79	4	4.21	UI	
Position 6	Rspos6	4.79	5	5.21	UI	
Position 7	Rspos7	5.79	6	6.21	UI	
Input data skew margin	TRSKM	-	-	400	ps	VID =400mV RXVCM=1.2V RXFCLK=85MHz
Clock high time	TLVCH	-	4/(7*RXFCLK)	-	ns	
Clock low time	TLVCL	-	3/(7*RXFCLK)	-	ns	
PLL wake-up time	TemPLL	-	-	150	us	

8.2



$T_{seM}$ : Receiver strobe margin  
 $T_{sw}$ : Strobe width (internal data sampling window)  
 $V_{TH} = R_{ovcm} + |V_{io}|/2$ ,  $V_{TL} = R_{ovcm} - |V_{io}|/2$

**9. RELIABILITY TEST**

<b>NO.</b>	<b>TEST ITEM</b>	<b>CONDITIONS</b>	
1	HIGH TEMPERATURE STORAGE	TA=85°C	240hrs
2	LOW TEMPERATURE STORAGE	TA=-30°C	240hrs
3	HIGH TEMPERATURE OPERATION	TA=85°C	240hrs
4	LOW TEMPERATURE OPERATION	TA=-30°C	240hrs
5	HIGH TEMPERATURE AND HIGH HUMIDITY OPERATION	TA=+60°C, 90%RH	240hrs

**10. LCD MODULES HANDLING PRECAUTIONS**

- n** The display panel is made of glass. Do not subject it to a mechanical shock by dropping it from a high place, etc.
- n** If the display panel is damaged and the liquid crystal substance inside it leaks out, do not get any in your mouth. If the substance come into contact with your skin or clothes promptly wash it off using soap and water.
- n** Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary.
- n** The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarize carefully.
- n** To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.
  - Be sure to ground the body when handling the LCD module.
  - Tools required for assembly, such as soldering irons, must be properly grounded.
  - To reduce the amount of static electricity generated, do not conduct assembly and other work under dry conditions.
  - The LCD module is coated with a film to protect the display surface. Exercise care when peeling off this protective film since static electricity may be generated.
- n** Storage precautions  
When storing the LCD modules, avoid exposure to direct sunlight or to the light of fluorescent lamps. Keep the modules in bags designed to prevent static electricity charging under low temperature / normal humidity conditions (avoid high temperature / high humidity and low temperatures below 0°C). Whenever possible, the LCD modules should be stored in the same conditions in which they were shipped from our company.

**11. OTHERS**

- n** Liquid crystals solidify at low temperature (below the storage temperature range) leading to defective orientation of liquid crystal or the generation of air bubbles (black or white). Air bubbles may also be generated if the module is subjected to a strong shock at a low temperature.
- n** If the LCD modules have been operating for a long time showing the same display patterns may remain on the screen as ghost images and a slight contrast irregularity may also appear. Abnormal operating status can be resumed to be normal condition by suspending use for some time. It should be noted that this phenomena does not adversely affect performance reliability.
- n** To minimize the performance degradation of the LCD modules resulting from caused by static electricity, etc. exercise care to avoid holding the following sections when handling the modules:
  - Exposed area of the printed circuit board
  - Terminal electrode sections.